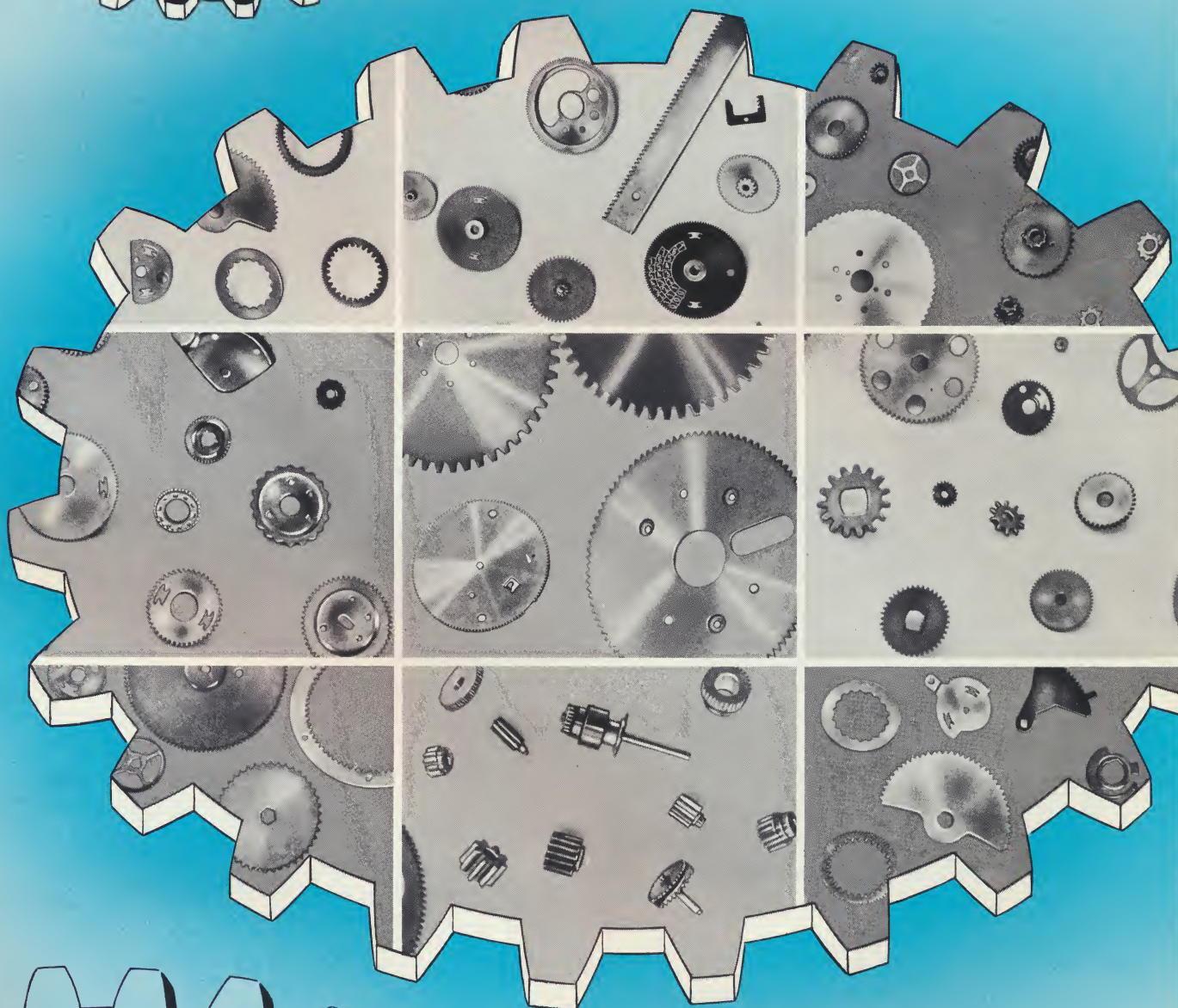




SPUR • CROWN  
COMBINATION  
INTERNAL • EXTERNAL  
RACKS • SEGMENTS  
SPROCKETS • RATCHETS



**WINZELER**

Manufacturing & Tool Company

7355 W. WILSON AVENUE CHICAGO, ILL. 60656

(312) 867-7971

*Other Winzeler Products*

**PRECISION DIES • STAMPINGS**

**MOLDED GEARS**

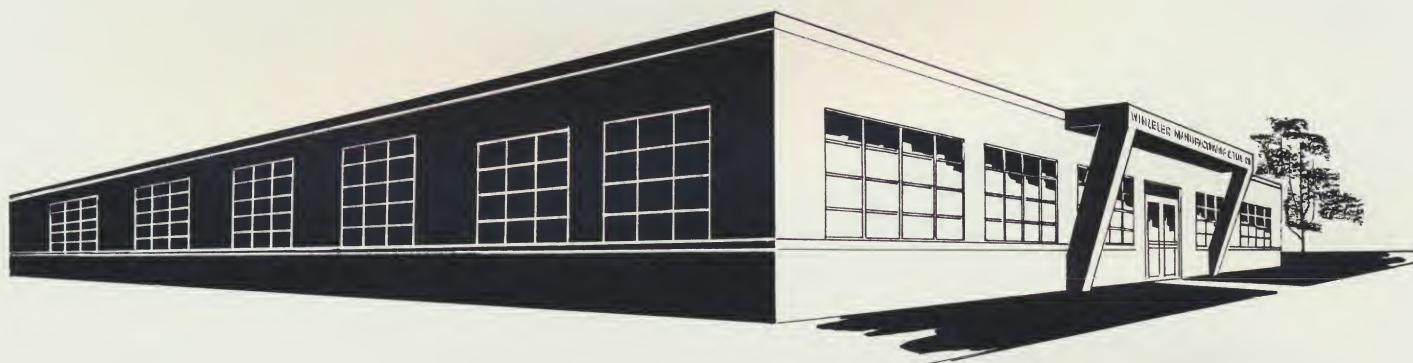
**ELECTRICAL DISCHARGE MACHINING**



# WINZELER MANUFACTURING & TOOL COMPANY . . .

. . . is proud to be known as one of the leading manufacturers of uniform, accurate Stamped Gears, as well as producers of truly fine dies, jigs, fixtures and small stampings of all types. We hope that you will have an opportunity to take advantage of our more than 15 years of success in the specialized field of gear tool-

ing and production, and our more than 40 years experience as builders of fine tools. The information given in this brochure should answer most of your initial questions concerning Winzeler products and services. We also list our ever growing selection of stock dies, from which gears and related parts are speedily and efficiently made to your order.



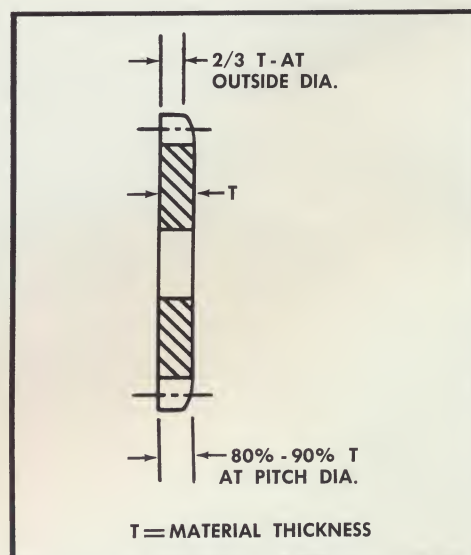
## SPUR GEARS

Stamped gears are produced to commercial tolerances and are recommended for light and medium duty applications where light weight is desirable and low cost is an important factor.

Winzeler Stamped Spur Gears are available in 8 to 120 pitch and both  $14\frac{1}{2}^\circ$  and  $20^\circ$  pressure angles. Sizes range from  $3/16"$  to  $8"$  pitch diameters. Gears may be stamped from most ferrous and non-ferrous metals, but the thickness used is restricted by the pitch of the gear and the stamping characteristics

of the material. Gears stamped from nonmetallic materials are restricted to thinner gages than are metallic gears.

The face of a stamped gear tooth is radiused on one side from the outside diameter to slightly below the pitch diameter. In cases where the material thickness approaches or exceeds the tooth width at the pitch line, the face width of the tooth at the outside diameter will be approximately  $2/3$  material thickness, and 80% to 90% of material thickness at the pitch diameter.



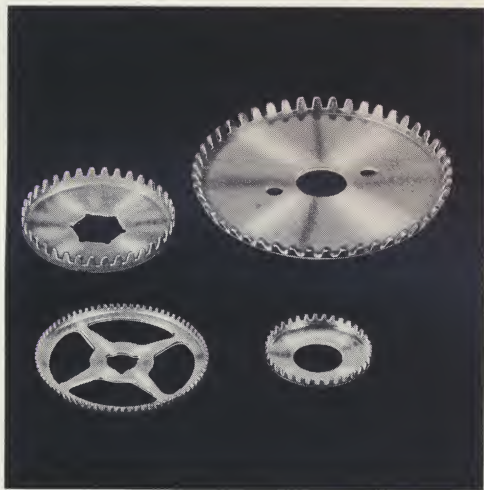
Radiused Teeth Caused By Die "Pull-Down"—  
A Natural Characteristic of Stamped Gears



# PINIONS

Spur pinions made from drawn pinion wire provide economical and serviceable mates to Winzeler Stamped Gears. Shapes can be varied to fit many applications. Face widths are virtually unlimited. The use of wide face pinions in conjunction with stamped gears minimizes assembly and alignment problems. Proper design eliminates unnecessary parts and reduces handling costs.

Winzeler can now furnish spur pinions made from drawn pinion wire in brass or steel. Sizes range from 16 to 120 pitch, and up to 1" diameter in the medium and coarser pitches. Both standard pressure angles ( $14\frac{1}{2}^\circ$  and  $20^\circ$ ) are available in most sizes. Production quantities are manufactured at low piece part costs. In cases where tooling is required, charges are very nominal.

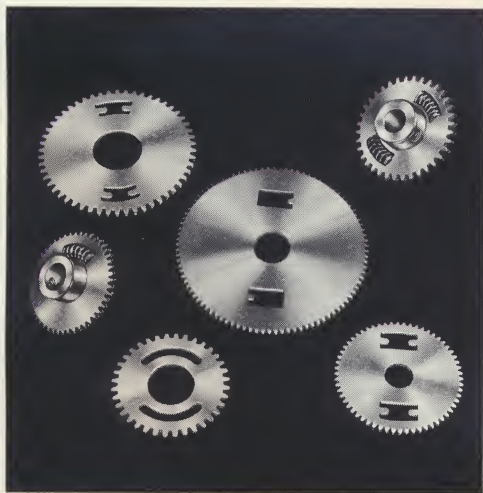


# CROWN GEARS

Winzeler Stamped Crown Gears offer an inexpensive method of changing the plane of rotation between two mating gears. Great cost reductions have been realized by substituting a crown gear and pinion or two crown gears for a pair of machined bevel gears. Crown gears are blanked with a specially developed tooth shape which becomes standard when crowned. For a  $90^\circ$  change in plane, two  $45^\circ$  crown gears or one  $90^\circ$  crown gear mating with a smaller spur pinion may be used. Although dies may be made for any crown angle,  $45^\circ$ ,  $60^\circ$  and  $90^\circ$  are most common.

# SPROCKETS

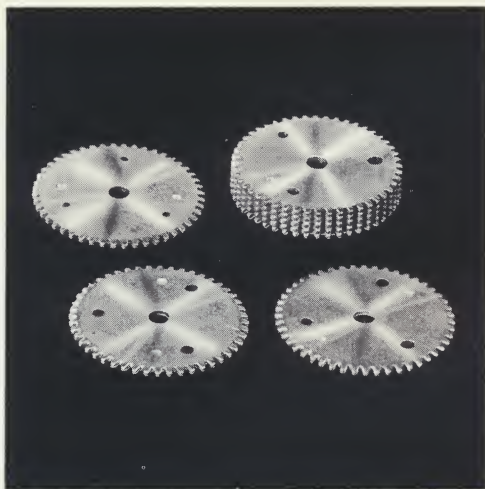
Winzeler now has a wide range of stock tooling for 1-A Ladder Chain Sprockets, .185" circular pitch. These may be made as flat stampings or as one piece sprocket and hub combinations from screw machine blanks. Hubs can be made exactly to the customer's specifications with little or no tooling expense. We can also tool for standard Roller Sprockets and for Ladder Chain Sprockets of sizes other than those listed.



# ANTI-BACKLASH GEARS

Stock dies are available for piercing anti-backlash spring pockets in most spur gears of 1.125" pitch diameter, or larger. Both rectangular and radial shaped spring pocket designs are used. Winzeler also produces anti-backlash gear assemblies, complete with hubs and springs.



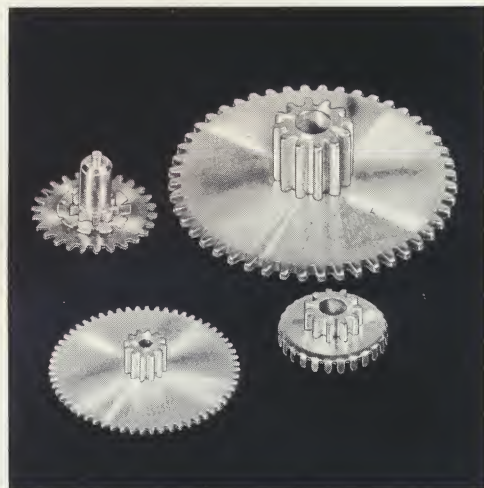


## LAMINATED GEARS

Spur gears for heavier loads may be produced at great savings by laminating two or more stamped gears. Accurate tooth alignment is accomplished through the use of half extrusions. Gears are securely fastened by rivets, welding or brazing.

## GEAR ASSEMBLIES

Winzeler furnishes subassemblies of stamped gears with pinions, hubs, shafts or any combination of these. Gears are fastened by staking or brazing.



## SPECIAL GEARS

Any gear which can be stamped can be tooled to the customer's exact specifications for production in a wide range of materials. We make special gears of every type, including internals, segments, ratchets and sprockets.

### PLEASE NOTE!

When requesting quotations, you will save time if you include the following information:

**GEAR SPECIFICATION NUMBER**  
**MATERIAL AND THICKNESS**  
**FINISH**  
**QUANTITY**

If the size you require is not listed, please submit a drawing, sample or complete specifications.

# WINZELER STAMPED GEARS

✱ Made to Order from Stock Dies ✱

| GEAR SPECIFICATION NUMBER | DIAMETRAL PITCH | PRESSURE ANGLE | NUMBER OF TEETH | PITCH DIAMETER | CENTER HOLE |                    | MATERIAL THICKNESS |
|---------------------------|-----------------|----------------|-----------------|----------------|-------------|--------------------|--------------------|
|                           |                 |                |                 |                | SHAPE       | SIZE               |                    |
| 0842A728                  | 8               | 14½°           | 42              | 5.250"         | PLAIN       | .728" DIA.         | .089"              |
| 0848A640                  | 8               | 14½°           | 48              | 6.000"         | PLAIN       | .640" DIA.         | .089"              |
| 0848A728                  | 8               | 14½°           | 48              | 6.000"         | PLAIN       | .728" DIA.         | .089"              |
| 1215L546                  | 12              | 14½°           | 15              | 1.250"         | SLOTTED     | .547" DIA.         | .065"              |
| 1215E610                  | 12              | 14½°           | 15              | 1.250"         | DOUBLE "D"  | .610" Dia. x .470" | .065"              |
| 1225L546                  | 12              | 14½°           | 25              | 2.083"         | SLOTTED     | .547" DIA.         | .083"              |
| 14100YA1627               | 14              | 20°            | 100             | 7.143"         | PLAIN       | 1.627" DIA.        | .125"              |
| 1610E222                  | 16              | 14½°           | 10              | .625"          | DOUBLE "D"  | .222" Dia. x .176" | .072"              |
| 1612A383                  | 16              | 14½°           | 12              | .750"          | PLAIN       | .383" DIA.         | .093"              |
| 1618K378                  | 16              | 14½°           | 18              | 1.125"         | KEYED       | .378" DIA.         | .093"              |
| 1630B375                  | 16              | 14½°           | 30              | 1.875"         | STAKING     | .375" DIA.         | .090"              |
| 1632A250                  | 16              | 14½°           | 32              | 2.000"         | PLAIN       | .250" DIA.         | .156"              |
| 1632E258                  | 16              | 14½°           | 32              | 2.000"         | DOUBLE "D"  | .258" Dia. x .208" | .156"              |
| 1632A282                  | 16              | 14½°           | 32              | 2.000"         | PLAIN       | .282" DIA.         | .156"              |
| 1647C250                  | 16              | 14½°           | 47              | 2.937"         | SQUARE      | .250"              | .125"              |
| 1647A750                  | 16              | 14½°           | 47              | 2.937"         | PLAIN       | .750" DIA.         | .125"              |
| 1622YC527                 | 16              | 20°            | 22              | 1.375"         | SQUARE      | .527"              | .120"              |
| 1664YA252                 | 16              | 20°            | 64              | 4.000"         | PLAIN       | .252" DIA.         | .120"              |
| 1664YB1003                | 16              | 20°            | 64              | 4.000"         | STAKING     | 1.003" DIA.        | .120"              |
| 2016A246                  | 20              | 14½°           | 16              | .750"          | PLAIN       | .246" DIA.         | .065"              |
| 2016R260                  | 20              | 14½°           | 16              | .750"          | RECTANGULAR | .260" x .070"      | .042"              |
| 2018E313                  | 20              | 14½°           | 18              | .900"          | DOUBLE "D"  | .313" DIA. x .251" | .093"              |
| 2019E313                  | 20              | 14½°           | 19              | .950"          | DOUBLE "D"  | .313" DIA. x .251" | .093"              |
| 2020E313                  | 20              | 14½°           | 20              | 1.000"         | DOUBLE "D"  | .313" DIA. x .251" | .093"              |
| 2021E313                  | 20              | 14½°           | 21              | 1.050"         | DOUBLE "D"  | .313" DIA. x .251" | .093"              |
| 2022E313                  | 20              | 14½°           | 22              | 1.100"         | DOUBLE "D"  | .313" DIA. x .251" | .093"              |
| 2023E313                  | 20              | 14½°           | 23              | 1.150"         | DOUBLE "D"  | .313" DIA. x .251" | .090"              |
| 2024E313                  | 20              | 14½"           | 24              | 1.200"         | DOUBLE "D"  | .313" DIA. x .251" | .090"              |
| 2025E313                  | 20              | 14½°           | 25              | 1.250"         | DOUBLE "D"  | .313" DIA. x .251" | .093"              |
| 2026E313                  | 20              | 14½°           | 26              | 1.300"         | DOUBLE "D"  | .313" DIA. x .251" | .093"              |
| 2027E313                  | 20              | 14½°           | 27              | 1.350"         | DOUBLE "D"  | .313" DIA. x .251" | .093"              |
| 2028E313                  | 20              | 14½°           | 28              | 1.400"         | DOUBLE "D"  | .313" DIA. x .251" | .093"              |
| 2029E313                  | 20              | 14½°           | 29              | 1.450"         | DOUBLE "D"  | .313" DIA. x .251" | .093"              |
| 2030E313                  | 20              | 14½°           | 30              | 1.500"         | DOUBLE "D"  | .313" DIA. x .251" | .093"              |
| 2031E313                  | 20              | 14½°           | 31              | 1.550"         | DOUBLE "D"  | .313" DIA. x .251" | .093"              |
| 2032E313                  | 20              | 14½°           | 32              | 1.600"         | DOUBLE "D"  | .313" DIA. x .251" | .093"              |
| 2033E313                  | 20              | 14½°           | 33              | 1.650"         | DOUBLE "D"  | .313" DIA. x .251" | .093"              |
| 2034E313                  | 20              | 14½°           | 34              | 1.700"         | DOUBLE "D"  | .313" DIA. x .251" | .093"              |
| 2035E313                  | 20              | 14½°           | 35              | 1.750"         | DOUBLE "D"  | .313" DIA. x .251" | .093"              |
| 2036E313                  | 20              | 14½°           | 36              | 1.800"         | DOUBLE "D"  | .313" DIA. x .251" | .093"              |
| 2054B500                  | 20              | 14½°           | 54              | 2.700"         | STAKING     | .500" DIA.         | .072"              |
| 2056B500                  | 20              | 14½°           | 56              | 2.800"         | STAKING     | .500" DIA.         | .072"              |
| 2050YA814                 | 20              | 20°            | 50              | 2.500"         | PLAIN       | .814" DIA.         | .065"              |
| 2415E251                  | 24              | 14½°           | 15              | .625"          | DOUBLE "D"  | .251" DIA. x .130" | .062"              |
| 2418H218                  | 24              | 14½°           | 18              | .750"          | HEXAGONAL   | .218"              | .032"              |
| 2418A250                  | 24              | 14½°           | 18              | .750"          | PLAIN       | .250" DIA.         | .062"              |
| 2424E354                  | 24              | 14½°           | 24              | 1.000"         | DOUBLE "D"  | .354" DIA. x .314" | .048"              |
| 2440B346                  | 24              | 14½°           | 40              | 1.667"         | STAKING     | .346" DIA.         | .093"              |

Note: Hole sizes are not interchangeable from one gear to another.



# WINZELER STAMPED GEARS

\* Made to Order from Stock Dies \*

| GEAR SPECIFICATION NUMBER | DIAMETRAL PITCH | PRESSURE ANGLE | NUMBER OF TEETH | PITCH DIAMETER | CENTER HOLE |                    | MATERIAL THICKNESS |
|---------------------------|-----------------|----------------|-----------------|----------------|-------------|--------------------|--------------------|
|                           |                 |                |                 |                | SHAPE       | SIZE               |                    |
| 2448A251                  | 24              | 14½°           | 48              | 1.985"         | PLAIN       | .251" DIA.         | .075"              |
| 2448A394                  | 24              | 14½°           | 48              | 2.000"         | PLAIN       | .394" DIA.         | .075"              |
| 2448A500                  | 24              | 14½°           | 48              | 2.000"         | PLAIN       | .500" DIA.         | .075"              |
| 2453A376                  | 24              | 14½°           | 53              | 2.205"         | PLAIN       | .376" DIA.         | .050"              |
| 2460A500                  | 24              | 14½°           | 24              | 2.500"         | PLAIN       | .500" DIA.         | .075"              |
| 2460H562                  | 24              | 14½°           | 60              | 2.500"         | HEXAGONAL   | .562"              | .090"              |
| 2460A1258                 | 24              | 14½°           | 60              | 2.500"         | PLAIN       | 1.258" DIA.        | .070"              |
| 2472B625                  | 24              | 14½°           | 72              | 3.000"         | STAKING     | .625 DIA.          | .075"              |
| 2412YA126                 | 24              | 20°            | 12              | .500"          | PLAIN       | .126" DIA.         | .067"              |
| 2425YA313                 | 24              | 20°            | 25              | 1.041"         | PLAIN       | .313" DIA.         | .032"              |
| 2433YB327                 | 24              | 20°            | 33              | 1.375"         | STAKING     | .327" DIA.         | .060"              |
| 2440YH303                 | 24              | 20°            | 40              | 1.667"         | HEXAGONAL   | .303"              | .032"              |
| 2466YA531                 | 24              | 20°            | 66              | 2.750"         | PLAIN       | .531" DIA.         | .090"              |
| 2466YA625                 | 24              | 20°            | 66              | 2.750"         | PLAIN       | .625" DIA.         | .093"              |
| 2481YC312                 | 24              | 20°            | 81              | 3.375"         | SQUARE      | .312"              | .083"              |
| 2482YA625                 | 24              | 20°            | 82              | 3.417"         | PLAIN       | .625" DIA.         | .075"              |
| 2496YA625                 | 24              | 20°            | 96              | 4.000"         | PLAIN       | .625" DIA.         | .089"              |
| 24110YA1250               | 24              | 20°            | 110             | 4.583"         | PLAIN       | 1.250" DIA.        | .092"              |
| 24120YA1250               | 24              | 20°            | 120             | 5.000"         | PLAIN       | 1.250" DIA.        | .093"              |
| 24150YA719                | 24              | 20°            | 150             | 6.250"         | PLAIN       | .719" DIA.         | .064"              |
| 24150YA2750               | 24              | 20°            | 150             | 6.250"         | PLAIN       | 2.750" DIA.        | .060"              |
| 3212E189                  | 32              | 14½°           | 12              | .375"          | DOUBLE "D"  | .189" Dia. x .158" | .065"              |
| 3214A127                  | 32              | 14½°           | 14              | .437"          | PLAIN       | .127" DIA.         | .064"              |
| 3216E250                  | 32              | 14½°           | 16              | .500"          | DOUBLE "D"  | .250" Dia. x .188" | .045"              |
| 3220A188                  | 32              | 14½°           | 20              | .625"          | PLAIN       | .188" DIA.         | .064"              |
| 3224A188                  | 32              | 14½°           | 24              | .750"          | PLAIN       | .188" DIA.         | .064"              |
| 3224A252                  | 32              | 14½°           | 24              | .750"          | PLAIN       | .252" DIA.         | .060"              |
| 3224A360                  | 32              | 14½°           | 24              | .750"          | PLAIN       | .360" DIA.         | .025"              |
| 3224B438                  | 32              | 14½°           | 24              | .750"          | STAKING     | .438" DIA.         | .048"              |
| 3225A251                  | 32              | 14½°           | 25              | .782"          | PLAIN       | .251" DIA.         | .064"              |
| 3225E251                  | 32              | 14½°           | 25              | .782"          | DOUBLE "D"  | .251 Dia. x .188"  | .065"              |
| 3226A187                  | 32              | 14½°           | 26              | .812"          | PLAIN       | .187" DIA.         | .050"              |
| 3227A250                  | 32              | 14½°           | 27              | .844"          | PLAIN       | .250" DIA.         | .090"              |
| 3228A309                  | 32              | 14½°           | 28              | .875"          | PLAIN       | .309" DIA.         | .064"              |
| 3230A251                  | 32              | 14½°           | 30              | .937"          | PLAIN       | .251" DIA.         | .064"              |
| 3232A188                  | 32              | 14½°           | 32              | 1.000"         | PLAIN       | .188" DIA.         | .064"              |
| 3236A188                  | 32              | 14½°           | 36              | 1.125"         | PLAIN       | .188" DIA.         | .062"              |
| 3236A255                  | 32              | 14½°           | 36              | 1.125"         | PLAIN       | .255" DIA.         | .040"              |
| 3236A313                  | 32              | 14½°           | 36              | 1.125"         | PLAIN       | .313" DIA.         | .040"              |
| 3236A375                  | 32              | 14½°           | 36              | 1.125"         | PLAIN       | .375" DIA.         | .060"              |
| 3236A533                  | 32              | 14½°           | 36              | 1.125"         | PLAIN       | .533" DIA.         | .032"              |
| 3237D250                  | 32              | 14½°           | 37              | 1.156"         | "SINGLE "D" | .250" Dia. x .218" | .047"              |
| 3238A249                  | 32              | 14½°           | 38              | 1.187"         | PLAIN       | .249" DIA.         | .064"              |
| 3239A189                  | 32              | 14½°           | 39              | 1.219"         | PLAIN       | .189" DIA.         | .062"              |
| 3240A128                  | 32              | 14½°           | 40              | 1.250"         | PLAIN       | .128" DIA.         | .062"              |
| 3240A250                  | 32              | 14½°           | 40              | 1.250"         | PLAIN       | .250" DIA.         | .060"              |
| 3240B377                  | 32              | 14½°           | 40              | 1.250"         | STAKING     | .377" DIA.         | .048"              |

Note: Hole sizes are not interchangeable from one gear to another.

# WINZELER STAMPED GEARS

✱ Made to Order from Stock Dies ✱

| GEAR SPECIFICATION NUMBER | DIAMETRAL PITCH | PRESSURE ANGLE | NUMBER OF TEETH | PITCH DIAMETER | CENTER HOLE |                    | MATERIAL THICKNESS |
|---------------------------|-----------------|----------------|-----------------|----------------|-------------|--------------------|--------------------|
|                           |                 |                |                 |                | SHAPE       | SIZE               |                    |
| 3244B250                  | 32              | 14½°           | 44              | 1.375"         | STAKING     | .250" DIA.         | .060"              |
| 3244A313                  | 32              | 14½°           | 44              | 1.375"         | PLAIN       | .313" DIA.         | .060"              |
| 3245A473                  | 32              | 14½°           | 45              | 1.406"         | PLAIN       | .473" DIA.         | .040"              |
| 3245A534                  | 32              | 14½°           | 45              | 1.406"         | PLAIN       | .534" DIA.         | .040"              |
| 3248A188                  | 32              | 14½°           | 48              | 1.500"         | PLAIN       | .188" DIA.         | .040"              |
| 3248A250                  | 32              | 14½°           | 48              | 1.500"         | PLAIN       | .250" DIA.         | .060"              |
| 3248A313                  | 32              | 14½°           | 48              | 1.500"         | PLAIN       | .313" DIA.         | .040"              |
| 3248A376                  | 32              | 14½°           | 48              | 1.500"         | PLAIN       | .376" DIA.         | .040"              |
| 3250B313                  | 32              | 14½°           | 50              | 1.562"         | STAKING     | .313" DIA.         | .050"              |
| 3251H303                  | 32              | 14½°           | 51              | 1.593"         | HEXAGONAL   | .303" DIA.         | .048"              |
| 3254A126                  | 32              | 14½°           | 54              | 1.687"         | PLAIN       | .126" DIA.         | .064"              |
| 3254B251                  | 32              | 14½°           | 54              | 1.687"         | STAKING     | .251" DIA.         | .060"              |
| 3254A375                  | 32              | 14½°           | 54              | 1.687"         | PLAIN       | .375" DIA.         | .062"              |
| 3254A547                  | 32              | 14½°           | 54              | 1.687"         | PLAIN       | .547" DIA.         | .040"              |
| 3256B500                  | 32              | 14½°           | 56              | 1.750"         | STAKING     | .500" DIA.         | .060"              |
| 3260A126                  | 32              | 14½°           | 60              | 1.875"         | PLAIN       | .126" DIA.         | .064"              |
| 3260B375                  | 32              | 14½°           | 60              | 1.875"         | STAKING     | .375" DIA.         | .050"              |
| 3260A376                  | 32              | 14½°           | 60              | 1.875"         | PLAIN       | .376" DIA.         | .050"              |
| 3264A376                  | 32              | 14½°           | 64              | 2.000"         | PLAIN       | .376" DIA.         | .050"              |
| 3264B438                  | 32              | 14½°           | 64              | 2.000"         | STAKING     | .438" DIA.         | .060"              |
| 3272H312                  | 32              | 14½°           | 72              | 2.250"         | HEXAGONAL   | .312"              | .050"              |
| 3272B375                  | 32              | 14½°           | 72              | 2.250"         | STAKING     | .375" DIA.         | .032"              |
| 3276B938                  | 32              | 14½°           | 76              | 2.375"         | STAKING     | .938" DIA.         | .075"              |
| 3280X250                  | 32              | 14½°           | 80              | 2.500"         | EXTRUDED    | .250" Dia. x .093" | .060"              |
| 3280A312                  | 32              | 14½°           | 80              | 2.500"         | PLAIN       | .312" DIA.         | .064"              |
| 3280A376                  | 32              | 14½°           | 80              | 2.500"         | PLAIN       | .376" DIA.         | .062"              |
| 3280A501                  | 32              | 14½°           | 80              | 2.500"         | PLAIN       | .501" DIA.         | .060"              |
| 3284S1606                 | 32              | 14½°           | 84              | 2.625"         | SPLINE      | 16 PITCH, 6 TEETH  | .062"              |
| 3296A188                  | 32              | 14½°           | 96              | 3.000"         | PLAIN       | .188" DIA.         | .040"              |
| 3296A375                  | 32              | 14½°           | 96              | 3.000"         | PLAIN       | .375" DIA.         | .050"              |
| 3296A501                  | 32              | 14½°           | 96              | 3.000"         | PLAIN       | .501" DIA.         | .064"              |
| 32100B375                 | 32              | 14½°           | 100             | 3.125"         | STAKING     | .375" DIA.         | .050"              |
| 32128B376                 | 32              | 14½°           | 128             | 4.000"         | STAKING     | .376" DIA.         | .042"              |
| 32176A250                 | 32              | 14½°           | 176             | 5.500"         | PLAIN       | .250" DIA.         | .064"              |
| 3222YH311                 | 32              | 20°            | 22              | .687"          | HEXAGONAL   | .311"              | .048"              |
| 3227YL311                 | 32              | 20°            | 27              | .844"          | SLOTTED     | .311" DIA.         | .048"              |
| 3242YB344                 | 32              | 20°            | 42              | 1.295"         | STAKING     | .344" DIA.         | .062"              |
| 3246YA377                 | 32              | 20°            | 46              | 1.437"         | PLAIN       | .377" DIA.         | .093"              |
| 3248YA188                 | 32              | 20°            | 48              | 1.500"         | PLAIN       | .188" DIA.         | .060"              |
| 3260YA500                 | 32              | 20°            | 60              | 1.875"         | PLAIN       | .500" DIA.         | .057"              |
| 3268YA562                 | 32              | 20°            | 68              | 2.125"         | PLAIN       | .562" DIA.         | .063"              |
| 3279YE311                 | 32              | 20°            | 79              | 2.469"         | DOUBLE "D"  | .311" Dia. x .252" | .062"              |
| 3288YA562                 | 32              | 20°            | 88              | 2.750"         | PLAIN       | .562" DIA.         | .063"              |
| 3618A187                  | 36              | 14½°           | 18              | .500"          | PLAIN       | .187" DIA.         | .050"              |
| 4024A156                  | 40              | 14½°           | 24              | .600"          | PLAIN       | .156" DIA.         | .020"              |
| 4030A156                  | 40              | 14½°           | 30              | .750"          | PLAIN       | .156" DIA.         | .020"              |
| 4039B172                  | 40              | 14½°           | 39              | .975"          | STAKING     | .172" DIA.         | .050"              |
| 4821A040                  | 48              | 14½°           | 21              | .438"          | PLAIN       | .040" DIA.         | .015"              |
| 4822A125                  | 48              | 14½°           | 22              | .458"          | PLAIN       | .125" DIA.         | .050"              |
| 4826B130                  | 48              | 14½°           | 26              | .542"          | STAKING     | .130" DIA.         | .031"              |
| 4828A125                  | 48              | 14½°           | 28              | .583"          | PLAIN       | .125" DIA.         | .050"              |
| 4828A187                  | 48              | 14½°           | 28              | .583"          | PLAIN       | .187" DIA.         | .050"              |

Note: Hole sizes are not interchangeable from one gear to another.



# WINZELER STAMPED GEARS

✱ Made to Order from Stock Dies ✱

| GEAR SPECIFICATION NUMBER | DIAMETRAL PITCH | PRESSURE ANGLE | NUMBER OF TEETH | PITCH DIAMETER | CENTER HOLE |            | MATERIAL THICKNESS |
|---------------------------|-----------------|----------------|-----------------|----------------|-------------|------------|--------------------|
|                           |                 |                |                 |                | SHAPE       | SIZE       |                    |
| 4830A080                  | 48              | 14½°           | 30              | .625"          | PLAIN       | .080" DIA. | .032"              |
| 4830A253                  | 48              | 14½°           | 30              | .625"          | PLAIN       | .253" DIA. | .032"              |
| 4832K250                  | 48              | 14½°           | 32              | .667"          | KEYED       | .250" DIA. | .032"              |
| 4833A127                  | 48              | 14½°           | 33              | .687"          | PLAIN       | .127" DIA. | .020"              |
| 4834A285                  | 48              | 14½°           | 34              | .708"          | PLAIN       | .285" DIA. | .032"              |
| 4834A441                  | 48              | 14½°           | 34              | .708"          | PLAIN       | .441" DIA. | .032"              |
| 4836A156                  | 48              | 14½°           | 36              | .750"          | PLAIN       | .156" DIA. | .048"              |
| 4836A188                  | 48              | 14½°           | 36              | .750"          | PLAIN       | .188" DIA. | .040"              |
| 4838B187                  | 48              | 14½°           | 38              | .792"          | STAKING     | .187" DIA. | .032"              |
| 4839A140                  | 48              | 14½°           | 39              | .813"          | PLAIN       | .140" DIA. | .042"              |
| 4839A594                  | 48              | 14½°           | 39              | .832"          | PLAIN       | .594" DIA. | .064"              |
| 4840B156                  | 48              | 14½°           | 40              | .833"          | STAKING     | .156" DIA. | .031"              |
| 4840A312                  | 48              | 14½°           | 40              | .833"          | PLAIN       | .312" DIA. | .060"              |
| 4840A369                  | 48              | 14½°           | 40              | .833"          | PLAIN       | .369" DIA. | .064"              |
| 4842A188                  | 48              | 14½°           | 42              | .875"          | PLAIN       | .188" DIA. | .040"              |
| 4842A312                  | 48              | 14½°           | 42              | .875"          | PLAIN       | .312" DIA. | .040"              |
| 4842A390                  | 48              | 14½°           | 42              | .875"          | PLAIN       | .390" DIA. | .032"              |
| 4845A250                  | 48              | 14½°           | 45              | .938"          | PLAIN       | .250" DIA. | .032"              |
| 4846A277                  | 48              | 14½°           | 46              | .958"          | PLAIN       | .277" DIA. | .040"              |
| 4848A125                  | 48              | 14½°           | 48              | 1.000"         | PLAIN       | .125" DIA. | .064"              |
| 4848A188                  | 48              | 14½°           | 48              | 1.000"         | PLAIN       | .188" DIA. | .064"              |
| 4848A250                  | 48              | 14½°           | 48              | 1.000"         | PLAIN       | .250" DIA. | .040"              |
| 4848A313                  | 48              | 14½°           | 48              | 1.000"         | PLAIN       | .313" DIA. | .025"              |
| 4848A633                  | 48              | 14½°           | 48              | 1.000"         | PLAIN       | .633" DIA. | .042"              |
| 4852A253                  | 48              | 14½°           | 52              | 1.083"         | PLAIN       | .253" DIA. | .048"              |
| 4852T424                  | 48              | 14½°           | 52              | 1.083"         | OCTAGONAL   | .424"      | .048"              |
| 4855A250                  | 48              | 14½°           | 55              | 1.145"         | PLAIN       | .250" DIA. | .032"              |
| 4855A375                  | 48              | 14½°           | 55              | 1.145"         | PLAIN       | .365" DIA. | .032"              |
| 4856A156                  | 48              | 14½°           | 56              | 1.166"         | PLAIN       | .156" DIA. | .060"              |
| 4856A187                  | 48              | 14½°           | 56              | 1.166"         | PLAIN       | .187" DIA. | .032"              |
| 4856A377                  | 48              | 14½°           | 56              | 1.166"         | PLAIN       | .377" DIA. | .032"              |
| 4858A221                  | 48              | 14½°           | 58              | 1.210"         | PLAIN       | .221" DIA. | .060"              |
| 4858B321                  | 48              | 14½°           | 58              | 1.210"         | STAKING     | .321" DIA. | .030"              |
| 4858A453                  | 48              | 14½°           | 58              | 1.210"         | PLAIN       | .453" DIA. | .048"              |
| 4859A156                  | 48              | 14½°           | 59              | 1.230"         | PLAIN       | .156" DIA. | .060"              |
| 4860A128                  | 48              | 14½°           | 60              | 1.250"         | PLAIN       | .128" DIA. | .031"              |
| 4860A187                  | 48              | 14½°           | 60              | 1.250"         | PLAIN       | .187" DIA. | .048"              |
| 4860B251                  | 48              | 14½°           | 60              | 1.250"         | STAKING     | .251" DIA. | .040"              |
| 4860A312                  | 48              | 14½°           | 60              | 1.250"         | PLAIN       | .312" DIA. | .060"              |
| 4860A501                  | 48              | 14½°           | 60              | 1.250"         | PLAIN       | .501" DIA. | .032"              |
| 4862A421                  | 48              | 14½°           | 62              | 1.290"         | PLAIN       | .421" DIA. | .048"              |
| 4863A251                  | 48              | 14½°           | 63              | 1.313"         | PLAIN       | .251" DIA. | .031"              |
| 4864A188                  | 48              | 14½°           | 64              | 1.333"         | PLAIN       | .188" DIA. | .040"              |
| 4864A218                  | 48              | 14½°           | 64              | 1.333"         | PLAIN       | .218" DIA. | .041"              |
| 4864B313                  | 48              | 14½°           | 64              | 1.333"         | STAKING     | .313" DIA. | .032"              |
| 4869A187                  | 48              | 14½°           | 69              | 1.438"         | PLAIN       | .187" DIA. | .060"              |
| 4869B276                  | 48              | 14½°           | 69              | 1.438"         | STAKING     | .276" DIA. | .040"              |
| 4872A188                  | 48              | 14½°           | 72              | 1.490"         | PLAIN       | .188" DIA. | .060"              |
| 4872A250                  | 48              | 14½°           | 72              | 1.500"         | PLAIN       | .250" DIA. | .031"              |
| 4872A376                  | 48              | 14½°           | 72              | 1.500"         | PLAIN       | .376" DIA. | .040"              |
| 4872A472                  | 48              | 14½°           | 72              | 1.500"         | PLAIN       | .472" DIA. | .032"              |



# WINZELER STAMPED GEARS

✱ Made to Order from Stock Dies ✱

| GEAR SPECIFICATION NUMBER | DIAMETRAL PITCH | PRESSURE ANGLE | NUMBER OF TEETH | PITCH DIAMETER | CENTER HOLE |                    | MATERIAL THICKNESS |
|---------------------------|-----------------|----------------|-----------------|----------------|-------------|--------------------|--------------------|
|                           |                 |                |                 |                | SHAPE       | SIZE               |                    |
| 4875A313                  | 48              | 14½°           | 75              | 1.562"         | PLAIN       | .313" DIA.         | .060"              |
| 4878B329                  | 48              | 14½°           | 78              | 1.625"         | STAKING     | .329" DIA.         | .030"              |
| 4878A378                  | 48              | 14½°           | 78              | 1.625"         | PLAIN       | .378" DIA.         | .050"              |
| 4880A313                  | 48              | 14½°           | 80              | 1.667"         | PLAIN       | .313" DIA.         | .025"              |
| 4880A375                  | 48              | 14½°           | 80              | 1.667"         | PLAIN       | .375" DIA.         | .064"              |
| 4880A562                  | 48              | 14½°           | 80              | 1.667"         | PLAIN       | .562" DIA.         | .064"              |
| 4880A625                  | 48              | 14½°           | 80              | 1.667"         | PLAIN       | .625" DIA.         | .040"              |
| 4880A812                  | 48              | 14½°           | 80              | 1.667"         | PLAIN       | .812" DIA.         | .064"              |
| 4884A188                  | 48              | 14½°           | 84              | 1.750"         | PLAIN       | .188" DIA.         | .048"              |
| 4884A250                  | 48              | 14½°           | 84              | 1.750"         | PLAIN       | .250" DIA.         | .050"              |
| 4884A373                  | 48              | 14½°           | 84              | 1.750"         | PLAIN       | .373" DIA.         | .050"              |
| 4890A188                  | 48              | 14½°           | 90              | 1.875"         | PLAIN       | .188" DIA.         | .031"              |
| 4894A450                  | 48              | 14½°           | 94              | 1.960"         | PLAIN       | .450" DIA.         | .032"              |
| 4896A188                  | 48              | 14½°           | 96              | 2.000"         | PLAIN       | .188" DIA.         | .060"              |
| 4896A248                  | 48              | 14½°           | 96              | 2.000"         | PLAIN       | .248" DIA.         | .062"              |
| 4896A313                  | 48              | 14½°           | 96              | 2.000"         | PLAIN       | .313" DIA.         | .048"              |
| 4896A375                  | 48              | 14½°           | 96              | 2.000"         | PLAIN       | .375" DIA.         | .060"              |
| 4896A503                  | 48              | 14½°           | 96              | 2.000"         | PLAIN       | .503" DIA.         | .032"              |
| 48109A195                 | 48              | 14½°           | 109             | 2.270"         | PLAIN       | .195" DIA.         | .025"              |
| 48109A375                 | 48              | 14½°           | 109             | 2.270"         | PLAIN       | .375" DIA.         | .025"              |
| 48109A500                 | 48              | 14½°           | 109             | 2.270"         | PLAIN       | .500" DIA.         | .025"              |
| 48120A250                 | 48              | 14½°           | 120             | 2.500"         | PLAIN       | .250" DIA.         | .050"              |
| 48120A383                 | 48              | 14½°           | 120             | 2.500"         | PLAIN       | .383" DIA.         | .040"              |
| 48120A563                 | 48              | 14½°           | 120             | 2.500"         | PLAIN       | .563" DIA.         | .032"              |
| 48120B564                 | 48              | 14½°           | 120             | 2.500"         | STAKING     | .564" DIA.         | .032"              |
| 48192A376                 | 48              | 14½°           | 192             | 4.000"         | PLAIN       | .376" DIA.         | .050"              |
| 4815YA109                 | 48              | 20°            | 15              | .313"          | PLAIN       | .109" DIA.         | .057"              |
| 4817YC111                 | 48              | 20°            | 17              | .354"          | SQUARE      | .111" DIA.         | .064"              |
| 4818YA117                 | 48              | 20°            | 18              | .375"          | PLAIN       | .117" DIA.         | .032"              |
| 4820YE248                 | 48              | 20°            | 20              | .417"          | DOUBLE "D"  | .248" Dia. x .220" | .064"              |
| 4824YA250                 | 48              | 20°            | 24              | .500"          | PLAIN       | .250" DIA.         | .032"              |
| 4824YS4810                | 48              | 20°            | 24              | .500"          | SPLINE      | 48 PITCH, 10 TEETH | .032"              |
| 4826YA184                 | 48              | 20°            | 26              | .542"          | PLAIN       | .184" DIA.         | .040"              |
| 4842YA190                 | 48              | 20°            | 42              | .875"          | PLAIN       | .190" DIA.         | .060"              |
| 4854YB313                 | 48              | 20°            | 54              | 1.125"         | STAKING     | .313" DIA.         | .031"              |
| 4854YA375                 | 48              | 20°            | 54              | 1.125"         | PLAIN       | .375" DIA.         | .032"              |
| 4860YX156                 | 48              | 20°            | 60              | 1.250"         | EXTRUDED    | .156" Dia. x .070" | .032"              |
| 4860YA285                 | 48              | 20°            | 60              | 1.250"         | PLAIN       | .285" DIA.         | .032"              |
| 4860YB313                 | 48              | 20°            | 60              | 1.250"         | STAKING     | .313" DIA.         | .031"              |
| 4860YA376                 | 48              | 20°            | 60              | 1.250"         | PLAIN       | .376" DIA.         | .031"              |
| 4861YB312                 | 48              | 20°            | 61              | 1.271"         | STAKING     | .312" DIA.         | .036"              |
| 4863YK343                 | 48              | 20°            | 63              | 1.312"         | KEYED       | .343" DIA.         | .030"              |
| 4863YA437                 | 48              | 20°            | 63              | 1.312"         | PLAIN       | .437" DIA.         | .030"              |
| 4866YA162                 | 48              | 20°            | 66              | 1.375"         | PLAIN       | .162" DIA.         | .040"              |
| 4868YD315                 | 48              | 20°            | 68              | 1.417"         | SINGLE "D"  | .315" Dia. x .280" | .042"              |
| 4868YA375                 | 48              | 20°            | 68              | 1.417"         | PLAIN       | .375" DIA.         | .040"              |

Note: Hole sizes are not interchangeable from one gear to another.



# WINZELER STAMPED GEARS

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| GEAR SPECIFICATION NUMBER | DIAMETRAL PITCH | PRESSURE ANGLE | NUMBER OF TEETH | PITCH DIAMETER | CENTER HOLE |                    | MATERIAL THICKNESS |
|---------------------------|-----------------|----------------|-----------------|----------------|-------------|--------------------|--------------------|
|                           |                 |                |                 |                | SHAPE       | SIZE               |                    |
| 4871YA188                 | 48              | 20°            | 71              | 1.479"         | PLAIN       | .188" DIA.         | .032"              |
| 4871YA304                 | 48              | 20°            | 71              | 1.479"         | PLAIN       | .304" DIA.         | .032"              |
| 4872YL125                 | 48              | 20°            | 72              | 1.512"         | SLOTTED     | .125" DIA.         | .050"              |
| 4872YK377                 | 48              | 20°            | 72              | 1.512"         | KEYED       | .377" DIA.         | .050"              |
| 4880YH438                 | 48              | 20°            | 80              | 1.666"         | HEXAGONAL   | .438"              | .040"              |
| 4880YA503                 | 48              | 20°            | 80              | 1.666"         | PLAIN       | .503" DIA.         | .040"              |
| 4895YA280                 | 48              | 20°            | 95              | 1.979"         | PLAIN       | .280" DIA.         | .042"              |
| 48100YH376                | 48              | 20°            | 100             | 2.083"         | HEXAGONAL   | .376" DIA.         | .063"              |
| 48101YA255                | 48              | 20°            | 101             | 2.104"         | PLAIN       | .255" DIA.         | .042"              |
| 48101YA313                | 48              | 20°            | 101             | 2.104"         | PLAIN       | .313" DIA.         | .042"              |
| 48144YB437                | 48              | 20°            | 144             | 3.000"         | STAKING     | .437" DIA.         | .060"              |
| 5048A251                  | 50              | 14½°           | 48              | .947"          | PLAIN       | .251" DIA.         | .032"              |
| 5048E251                  | 50              | 14½°           | 48              | .947"          | DOUBLE "D"  | .251" Dia. x .190" | .032"              |
| 5050A251                  | 50              | 14½°           | 50              | .947"          | PLAIN       | .251" DIA.         | .032"              |
| 5050E251                  | 50              | 14½°           | 50              | .947"          | DOUBLE "D"  | .251" Dia. x .190" | .032"              |
| 5052A188                  | 50              | 14½°           | 52              | 1.040"         | PLAIN       | .188" DIA.         | .045"              |
| 5636A092                  | 56              | 14½°           | 36              | .643"          | PLAIN       | .092" DIA.         | .040"              |
| 5636A156                  | 56              | 14½°           | 36              | .643"          | PLAIN       | .156" DIA.         | .040"              |
| 5640A092                  | 56              | 14½°           | 40              | .714"          | PLAIN       | .092" DIA.         | .040"              |
| 5640A156                  | 56              | 14½°           | 40              | .714"          | PLAIN       | .156" DIA.         | .025"              |
| 5640A204                  | 56              | 14½°           | 40              | .714"          | PLAIN       | .204" DIA.         | .025"              |
| 6458A313                  | 64              | 14½°           | 58              | .906"          | PLAIN       | .313" DIA.         | .032"              |
| 6464D251                  | 64              | 14½°           | 64              | 1.000"         | SINGLE "D"  | .251" Dia. x .219" | .032"              |
| 6464Z093                  | 64              | 14½°           | 64              | 1.000"         | SERRATED    | .093" DIA.         | .020"              |
| 6424YA155                 | 64              | 20°            | 24              | .371"          | PLAIN       | .155" DIA.         | .062"              |
| 6430YA125                 | 64              | 20°            | 30              | .469"          | PLAIN       | .125" DIA.         | .067"              |
| 6436YA125                 | 64              | 20°            | 36              | .563"          | PLAIN       | .125" DIA.         | .036"              |
| 6436YA140                 | 64              | 20°            | 36              | .563"          | PLAIN       | .140" DIA.         | .036"              |
| 6436YA155                 | 64              | 20°            | 36              | .563"          | PLAIN       | .155" DIA.         | .062"              |
| 6436YA188                 | 64              | 20°            | 36              | .563"          | PLAIN       | .188" DIA.         | .036"              |
| 6448YA155                 | 64              | 20°            | 48              | .746"          | PLAIN       | .155" DIA.         | .062"              |
| 6456YA140                 | 64              | 20°            | 56              | .875"          | PLAIN       | .140" DIA.         | .048"              |
| 6458YA251                 | 64              | 20°            | 58              | .906"          | PLAIN       | .251" DIA.         | .031"              |
| 6460YA155                 | 64              | 20°            | 60              | .933"          | PLAIN       | .155" DIA.         | .062"              |
| 6460YA203                 | 64              | 20°            | 60              | .933"          | PLAIN       | .203" DIA.         | .045"              |
| 6463YA251                 | 64              | 20°            | 63              | .984"          | PLAIN       | .251" DIA.         | .042"              |
| 6464YA250                 | 64              | 20°            | 64              | 1.000"         | PLAIN       | .250" DIA.         | .032"              |
| 6464YA312                 | 64              | 20°            | 64              | 1.000"         | PLAIN       | .312" DIA.         | .045"              |
| 6464YA325                 | 64              | 20°            | 64              | 1.000"         | PLAIN       | .325" DIA.         | .057"              |
| 6466YA219                 | 64              | 20°            | 66              | 1.028"         | PLAIN       | .219" DIA.         | .062"              |
| 6468YA251                 | 64              | 20°            | 68              | 1.062"         | PLAIN       | .251" DIA.         | .040"              |
| 6469YA250                 | 64              | 20°            | 69              | 1.078"         | PLAIN       | .250" DIA.         | .040"              |
| 6472YA128                 | 64              | 20°            | 72              | 1.125"         | PLAIN       | .128" DIA.         | .032"              |
| 6472YA188                 | 64              | 20°            | 72              | 1.125"         | PLAIN       | .188" DIA.         | .032"              |
| 6490YA125                 | 64              | 20°            | 90              | 1.406"         | PLAIN       | .125" DIA.         | .067"              |
| 6496YA251                 | 64              | 20°            | 96              | 1.500"         | PLAIN       | .251" DIA.         | .031"              |
| 64112YA250                | 64              | 20°            | 112             | 1.780"         | PLAIN       | .250" DIA.         | .012"              |
| 64182YB438                | 64              | 20°            | 182             | 2.840"         | STAKING     | .438" DIA.         | .031"              |



# WINZELER STAMPED GEARS

✱ Made to Order from Stock Dies ✱

| GEAR<br>SPECIFICATION<br>NUMBER | DIAMETRAL<br>PITCH | PRESSURE<br>ANGLE | NUMBER<br>OF<br>TEETH | PITCH<br>DIAMETER | CENTER HOLE |            | MATERIAL<br>THICKNESS |
|---------------------------------|--------------------|-------------------|-----------------------|-------------------|-------------|------------|-----------------------|
|                                 |                    |                   |                       |                   | SHAPE       | SIZE       |                       |
| 8045A112                        | 80                 | 14½°              | 45                    | .562"             | PLAIN       | .112" DIA. | .020"                 |
| 8048A156                        | 80                 | 14½°              | 48                    | .600"             | PLAIN       | .156" DIA. | .025"                 |
| 8048A171                        | 80                 | 14½°              | 48                    | .600"             | PLAIN       | .171" DIA. | .040"                 |
| 8048A204                        | 80                 | 14½°              | 48                    | .600"             | PLAIN       | .204" DIA. | .025"                 |
| 8048A283                        | 80                 | 14½°              | 48                    | .600"             | PLAIN       | .283" DIA. | .020"                 |
| 8054A156                        | 80                 | 14½°              | 54                    | .674"             | PLAIN       | .156" DIA. | .025"                 |
| 8060A111                        | 80                 | 14½°              | 60                    | .750"             | PLAIN       | .111" DIA. | .040"                 |
| 8060A125                        | 80                 | 14½°              | 60                    | .750"             | PLAIN       | .125" DIA. | .025"                 |
| 8060A156                        | 80                 | 14½°              | 60                    | .750"             | PLAIN       | .156" DIA. | .025"                 |
| 8060YA156                       | 80                 | 20°               | 60                    | .750"             | PLAIN       | .156" DIA. | .025"                 |
| 9660A126                        | 96                 | 14½°              | 60                    | .625"             | PLAIN       | .126" DIA. | .025"                 |
| 9672A087                        | 96                 | 14½°              | 72                    | .750"             | PLAIN       | .087" DIA. | .020"                 |
| 96130A312                       | 96                 | 14½°              | 130                   | 1.354"            | PLAIN       | .312" DIA. | .032"                 |
| 12084YA139                      | 120                | 20°               | 84                    | .700"             | PLAIN       | .139" DIA. | .032"                 |
| 120108YA125                     | 120                | 20°               | 108                   | .900"             | PLAIN       | .125" DIA. | .032"                 |

## SEGMENT GEARS

| SEGMENT<br>SPECIFICATION<br>NUMBER | DIAMETRAL<br>PITCH | PRESSURE<br>ANGLE | NUMBER<br>OF<br>TEETH | PITCH<br>DIAMETER | CENTER HOLE |                    | MATERIAL<br>THICKNESS |
|------------------------------------|--------------------|-------------------|-----------------------|-------------------|-------------|--------------------|-----------------------|
|                                    |                    |                   |                       |                   | SHAPE       | SIZE               |                       |
| SG-2472-1                          | 24                 | 14½°              | 38                    | 3.000"            | PLAIN       | .360" DIA.         | .093"                 |
| SG-4840-1                          | 48                 | 14½°              | 32                    | .833"             | STAKING     | .188" DIA.         | .028"                 |
| SG-4840-2                          | 48                 | 14½°              | 32                    | .833"             | PLAIN       | .254" DIA.         | .028"                 |
| SG-4872-1                          | 48                 | 14½°              | 44                    | 1.500"            | PLAIN       | .104" DIA.         | .025"                 |
| SG-4872-2                          | 48                 | 14½°              | 44                    | 1.500"            | PLAIN       | .255" DIA.         | .025"                 |
| SG-4896-1                          | 48                 | 14½°              | 59                    | 2.000"            | EXTRUDED    | .361" DIA.         | .032"                 |
| SG-4896-2                          | 48                 | 14½°              | 59                    | 2.000"            | PLAIN       | .437" DIA.         | .032"                 |
| SG-4896-3                          | 48                 | 14½°              | 59                    | 2.000"            | DOUBLE "D"  | .313" Dia. x .251" | .032"                 |
| SG-48192-1                         | 48                 | 14½°              | 18                    | 4.000             | PLAIN       | .313" DIA.         | .050"                 |

## INTERNAL GEARS

| GEAR<br>SPECIFICATION<br>NUMBER | DIAMETRAL<br>PITCH | PRESSURE<br>ANGLE | NUMBER<br>OF<br>TEETH | OUTSIDE<br>DIAMETER | MATERIAL<br>THICKNESS |
|---------------------------------|--------------------|-------------------|-----------------------|---------------------|-----------------------|
| NT-2472-1                       | 24                 | 14½°              | 72                    | 3.758"              | .060"                 |

Note: Hole sizes are not interchangeable from one gear to another.



# WINZELER STAMPED GEARS

\* Made to Order from Stock Dies \*

## RING GEAR (INTERNAL—EXTERNAL)

| GEAR SPECIFICATION | DIAMETRAL PITCH | PRESSURE ANGLE | EXTERNAL TEETH | INTERNAL TEETH | MATERIAL THICKNESS |
|--------------------|-----------------|----------------|----------------|----------------|--------------------|
| 3260G3248          | 32              | 14½°           | 60             | 48             | .080"              |

## 1-A LADDER CHAIN SPROCKETS .185" Circular Pitch

| SPROCKET SPECIFICATION NUMBER | TYPE          | NUMBER OF TEETH | PITCH DIAMETER | OUTSIDE DIAMETER | CENTER HOLE |               | MATERIAL OR FACE THICKNESS |
|-------------------------------|---------------|-----------------|----------------|------------------|-------------|---------------|----------------------------|
|                               |               |                 |                |                  | SHAPE       | SIZE          |                            |
| 1A-5A125                      | Stamping      | 5               | .30"           | .43"             | PLAIN       | .125" DIA.    | .087"                      |
| 1A-6A170                      | Stamping      | 6               | .37"           | .51"             | PLAIN       | .170" DIA.    | .087"                      |
| 1A-8SC-1                      | Screw Machine | 8               | .48"           | .63"             | PLAIN       | .250" DIA.    | .087"                      |
| 1A-10SC-1                     | Screw Machine | 10              | .60"           | .75"             | PLAIN       | .251" DIA.    | .087"                      |
| 1A-10SC-2                     | Screw Machine | 10              | .60"           | .75"             | PLAIN       | .314" DIA.    | .087"                      |
| 1A-10SC-3                     | Screw Machine | 10              | .60"           | .75"             | PLAIN       | .149" DIA.    | .090"                      |
| 1A-10SC-4                     | Screw Machine | 10              | .60"           | .75"             | PLAIN       | .355" DIA.    | .090"                      |
| 1A-10A312                     | Stamping      | 10              | .60"           | .75"             | PLAIN       | .312" DIA.    | .074"                      |
| 1A-12SC-1                     | Screw Machine | 12              | .71"           | .86"             | PLAIN       | .251" DIA.    | .087"                      |
| 1A-12SC-2                     | Screw Machine | 12              | .71"           | .86"             | PLAIN       | .125" DIA.    | .087"                      |
| 1A-12SC-3                     | Screw Machine | 12              | .71"           | .86"             | PLAIN       | .313" DIA.    | .087"                      |
| 1A-12SC-4                     | Screw Machine | 12              | .71"           | .86"             | PLAIN       | .357" DIA.    | .087"                      |
| 1A-12D254                     | Stamping      | 12              | .71"           | .86"             | SINGLE "D"  | .254" x .203" | .090"                      |
| 1A-12A374                     | Stamping      | 12              | .71"           | .86"             | PLAIN       | .374" DIA.    | .090"                      |
| 1A-14SC-1                     | Screw Machine | 14              | .83"           | .98"             | PLAIN       | .251" DIA.    | .087"                      |
| 1A-24A313                     | Stamping      | 24              | 1.41"          | 1.56"            | PLAIN       | .313" DIA.    | .090"                      |
| 1A-24A438                     | Stamping      | 24              | 1.41"          | 1.56"            | PLAIN       | .438" DIA.    | .090"                      |
| 1A-24A531                     | Stamping      | 24              | 1.41"          | 1.56"            | PLAIN       | .531" DIA.    | .090"                      |
| 1A-34A436                     | Stamping      | 34              | 2.00"          | 2.15"            | PLAIN       | .436" DIA.    | .090"                      |
| 1A-42H375                     | Stamping      | 42              | 2.47"          | 2.61"            | HEXAGONAL   | .375"         | .090"                      |
| 1A-68A438                     | Stamping      | 68              | 4.00"          | 4.15"            | PLAIN       | .438" DIA.    | .090"                      |

## STAMPED RATCHETS

| RATCHET SPECIFICATION NUMBER | NUMBER OF TEETH | OUTSIDE DIAMETER | CENTER HOLE |                    | MATERIAL THICKNESS |
|------------------------------|-----------------|------------------|-------------|--------------------|--------------------|
|                              |                 |                  | SHAPE       | SIZE               |                    |
| RT-360982-1                  | 36              | .982"            | SINGLE "D"  | .185" DIA. x .140" | .048"              |
| RT-361920-1                  | 36              | 1.920"           | PLAIN       | .373" DIA.         | .060"              |
| RT-501920-1                  | 50              | 1.920"           | PLAIN       | .377" DIA.         | .060"              |

Note: Hole sizes are not interchangeable from one gear to another.



# WINZELER STAMPED CROWN GEARS

\* Made to Order from Stock Dies \*

| GEAR SPECIFICATION NUMBER | DIAMETRAL PITCH | NUMBER OF TEETH | PRESSURE ANGLE | OUTSIDE DIAMETER | CROWN ANGLE | OVERALL HEIGHT | CENTER HOLE |             | MATERIAL THICKNESS |
|---------------------------|-----------------|-----------------|----------------|------------------|-------------|----------------|-------------|-------------|--------------------|
|                           |                 |                 |                |                  |             |                | SHAPE       | SIZE        |                    |
| 45-2414L210               | 24              | 14              | 14½°           | .625"            | 45°         | .145"          | SLOTTED     | .210" DIA.  | .048"              |
| 45-2414H281               | 24              | 14              | 14½°           | .625"            | 45°         | .145"          | HEXAGONAL   | .281" DIA.  | .048"              |
| 45-2428H375               | 24              | 28              | 14½°           | 1.300"           | 45°         | .135"          | HEXAGONAL   | .375"       | .048"              |
| 45-2460A877               | 24              | 60              | 14½°           | 2.535"           | 45°         | .165"          | PLAIN       | .877" DIA.  | .060"              |
| 60-2448C188               | 24              | 48              | 14½°           | 1.963"           | 60°         | .140"          | SQUARE      | .188"       | .042"              |
| 60-2448A499               | 24              | 48              | 14½°           | 1.963"           | 60°         | .140"          | PLAIN       | .499" DIA.  | .042"              |
| 90-2450T626               | 24              | 50              | 14½°           | 2.000"           | 90°         | .150"          | OCTAGONAL   | .626"       | .048"              |
| 90-24108X2750             | 24              | 108             | 14½°           | 4.560"           | 90°         | .240"          | EXTRUDED    | 2.750" DIA. | .060"              |
| 90-3220B313               | 32              | 20              | 14½°           | .675"            | 90°         | .125"          | STAKING     | .313" DIA.  | .025"              |
| 90-4832A188               | 48              | 32              | 14½°           | .682"            | 90°         | .112"          | PLAIN       | .188" DIA.  | .015"              |
| 90-4836A188               | 48              | 36              | 14½°           | .770"            | 90°         | .118"          | PLAIN       | .188"       | .018"              |
| 90-4836H188               | 48              | 36              | 14½°           | .770"            | 90°         | .118"          | HEXAGONAL   | .188"       | .018"              |
| 90-4836A280               | 48              | 36              | 14½°           | .770"            | 90°         | .118"          | PLAIN       | .280" DIA.  | .018"              |
| 90-4836A358               | 48              | 36              | 14½°           | .770"            | 90°         | .118"          | PLAIN       | .358" DIA.  | .018"              |
| 90-4840A160               | 48              | 40              | 14½°           | .870"            | 90°         | .113"          | PLAIN       | .160" DIA.  | .018"              |
| 90-4840A313               | 48              | 40              | 14½°           | .870"            | 90°         | .113"          | PLAIN       | .313" DIA.  | .018"              |
| 90-4842B313               | 48              | 42              | 14½°           | .900"            | 90°         | .125"          | STAKING     | .313" DIA.  | .025"              |
| 90-4842X405               | 48              | 42              | 14½°           | .900"            | 90°         | .125"          | EXTRUDED    | .405" DIA.  | .025"              |
| 90-4842X452               | 48              | 42              | 14½°           | .900"            | 90°         | .125"          | EXTRUDED    | .452" DIA.  | .025"              |
| 90-6030A286               | 60              | 30              | 14½°           | .560"            | 90°         | .140"          | PLAIN       | .286" DIA.  | .030"              |
| 90-6448YB281              | 64              | 48              | 20°            | .750"            | 90°         | .070"          | STAKING     | .281" DIA.  | .025"              |
| 90-6456YA313              | 64              | 56              | 20°            | .865"            | 90°         | .105"          | PLAIN       | .313" DIA.  | .025"              |
| 90-6456YA375              | 64              | 56              | 20°            | .865"            | 90°         | .105"          | PLAIN       | .375" DIA.  | .025"              |
| 90-6480YB219              | 64              | 80              | 20°            | 1.275"           | 90°         | .110"          | STAKING     | .219" DIA.  | .025"              |
| 90-6480YA375              | 64              | 80              | 20°            | 1.275"           | 90°         | .110"          | PLAIN       | .375" DIA.  | .025"              |
| 90-6480B359               | 64              | 80              | 14½°           | 1.313"           | 90°         | .100"          | STAKING     | .359" DIA.  | .025"              |
| 90-6480Z439               | 64              | 80              | 14½°           | 1.313"           | 90°         | .100"          | SERRATED    | .439" DIA.  | .025"              |
| 90-6480B578               | 64              | 80              | 14½°           | 1.313"           | 90°         | .100"          | STAKING     | .578" DIA.  | .025"              |

Note: Hole sizes are not interchangeable from one gear to another.

# **RULES AND FORMULAS FOR SPUR GEARS – DIAMETRAL PITCH**

Diametral Pitch is the Number of Teeth to Each Inch of the Pitch Diameter

| TO GET                                  | HAVING                                         | RULE                                                                                    | FORMULA                         |
|-----------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------|---------------------------------|
| Diametral .....<br>pitch (P)            | The circular pitch .....                       | Divide 3.1416 by the circular pitch .....                                               | $P = \frac{3.1416}{p}$          |
| Diametral<br>pitch (P)                  | The pitch diameter and the number of teeth.... | Divide number of teeth by pitch diameter.....                                           | $P = \frac{N}{D}$               |
| Pitch<br>diameter (D)                   | The number of teeth and the diametral pitch    | Divide number of teeth by the diametral<br>pitch .....                                  | $D = \frac{N}{P}$               |
| Pitch<br>diameter (D)                   | The number of teeth and the outside diameter   | Divide the product of outside diameter and<br>number of teeth by number of teeth plus 2 | $D = \frac{D_o N}{N+2}$         |
| Outside<br>diameter (D <sub>o</sub> )   | The number of teeth and the diametral pitch    | Divide number of teeth plus 2 by the diametral<br>pitch .....                           | $D_o = \frac{N+2}{P}$           |
| Number of<br>teeth (N)                  | The pitch diameter and the diametral pitch.... | Multiply pitch diameter by the diametral pitch                                          | $N = DP$                        |
| Thickness of<br>tooth (t <sub>t</sub> ) | The diametral pitch .....                      | Divide 1.5708 by the diametral pitch .....                                              | $t_t = \frac{1.5708}{P}$        |
| Addendum (a)                            | The diametral pitch .....                      | Divide 1 by the diametral pitch .....                                                   | $a = \frac{1}{P}$               |
| Whole<br>depth (h <sub>t</sub> )        | The diametral pitch .....                      | Divide 2.200 by the diametral pitch,<br>and add .002".....                              | $h_t = \frac{2.200}{P} + 0.002$ |

**TABLE OF TOOTH PARTS**

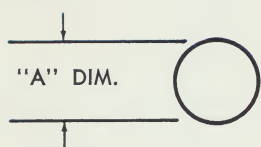
| DIAMETRAL<br>PITCH | CIRCULAR<br>PITCH | ARC TOOTH<br>THICKNESS | ADDENDUM | WORKING<br>DEPTH | WHOLE<br>DEPTH |
|--------------------|-------------------|------------------------|----------|------------------|----------------|
| 6                  | .5236"            | .2618"                 | .1667"   | .1333"           | .3750"*        |
| 8                  | .3927"            | .1964"                 | .1250"   | .2500"           | .2813"*        |
| 10                 | .3142"            | .1571"                 | .1000"   | .2000"           | .2250"*        |
| 12                 | .2618"            | .1309"                 | .0833"   | .1666"           | .1875"*        |
| 14                 | .2244"            | .1122"                 | .0714"   | .1429"           | .1607"*        |
| 16                 | .1964"            | .0982"                 | .0625"   | .1250"           | .1406"*        |
| 18                 | .1745"            | .0873"                 | .0556"   | .1111"           | .1250"*        |
| 20                 | .1571"            | .0785"                 | .0500"   | .1000"           | .1120"         |
| 22                 | .1428"            | .0714"                 | .0455"   | .0909"           | .1020"         |
| 24                 | .1309"            | .0655"                 | .0417"   | .0833"           | .0937"         |
| 26                 | .1208"            | .0604"                 | .0385"   | .0769"           | .0866"         |
| 28                 | .1122"            | .0561"                 | .0357"   | .0714"           | .0806"         |
| 30                 | .1047"            | .0524"                 | .0333"   | .0667"           | .0753"         |
| 32                 | .0982"            | .0491"                 | .0313"   | .0625"           | .0708"         |
| 36                 | .0873"            | .0436"                 | .0278"   | .0556"           | .0631"         |
| 40                 | .0785"            | .0393"                 | .0250"   | .0500"           | .0570"         |
| 44                 | .0714"            | .0357"                 | .0227"   | .0455"           | .0520"         |
| 48                 | .0655"            | .0327"                 | .0208"   | .0417"           | .0478"         |
| 56                 | .0561"            | .0281"                 | .0179"   | .0357"           | .0413"         |
| 64                 | .0491"            | .0245"                 | .0156"   | .0313"           | .0364"         |
| 72                 | .0436"            | .0218"                 | .0139"   | .0278"           | .0326"         |
| 80                 | .0393"            | .0196"                 | .0125"   | .0250"           | .0295"         |
| 96                 | .0327"            | .0164"                 | .0104"   | .0208"           | .0249"         |
| 120                | .0262"            | .0131"                 | .0083"   | .0167"           | .0203"         |

\*For pitches coarser than 20P, use  $\frac{2.25}{P}$  for calculating h<sub>t</sub>.

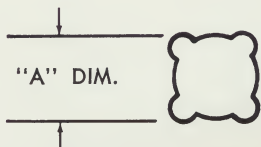


# WINZELER CODE LETTERS FOR COMMONLY SPECIFIED CENTER HOLE SHAPES

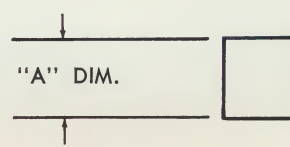
Hole sizes are not interchangeable from one gear to another.



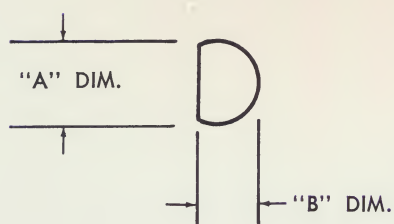
TYPE "A"  
PLAIN



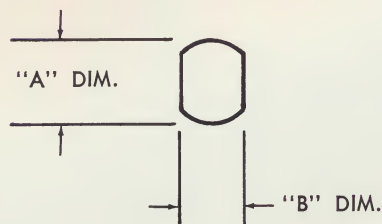
TYPE "B"  
STAKING



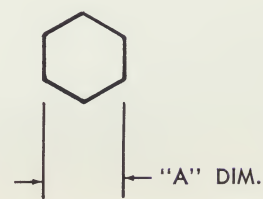
TYPE "C"  
SQUARE



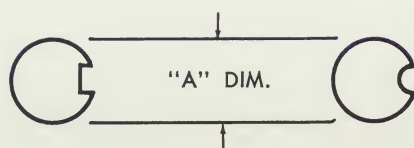
TYPE "D"  
SINGLE "D"



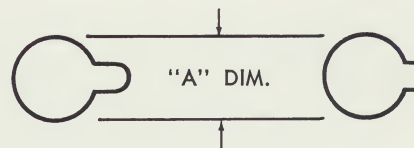
TYPE "E"  
DOUBLE "D"



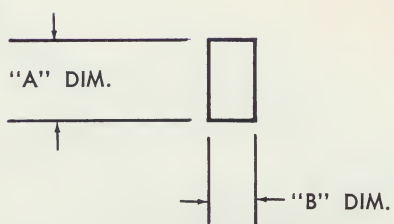
TYPE "H"  
HEXAGONAL \*



TYPE "K"  
KEYED



TYPE "L"  
SLOTTED



TYPE "R"  
RECTANGULAR

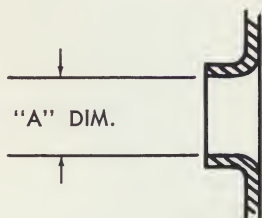


TYPE "S"  
SPLINE

DIAMETERS DEFINED BY  
DIAMETRAL PITCH AND  
NUMBER OF TEETH



TYPE "T"  
OCTAGONAL

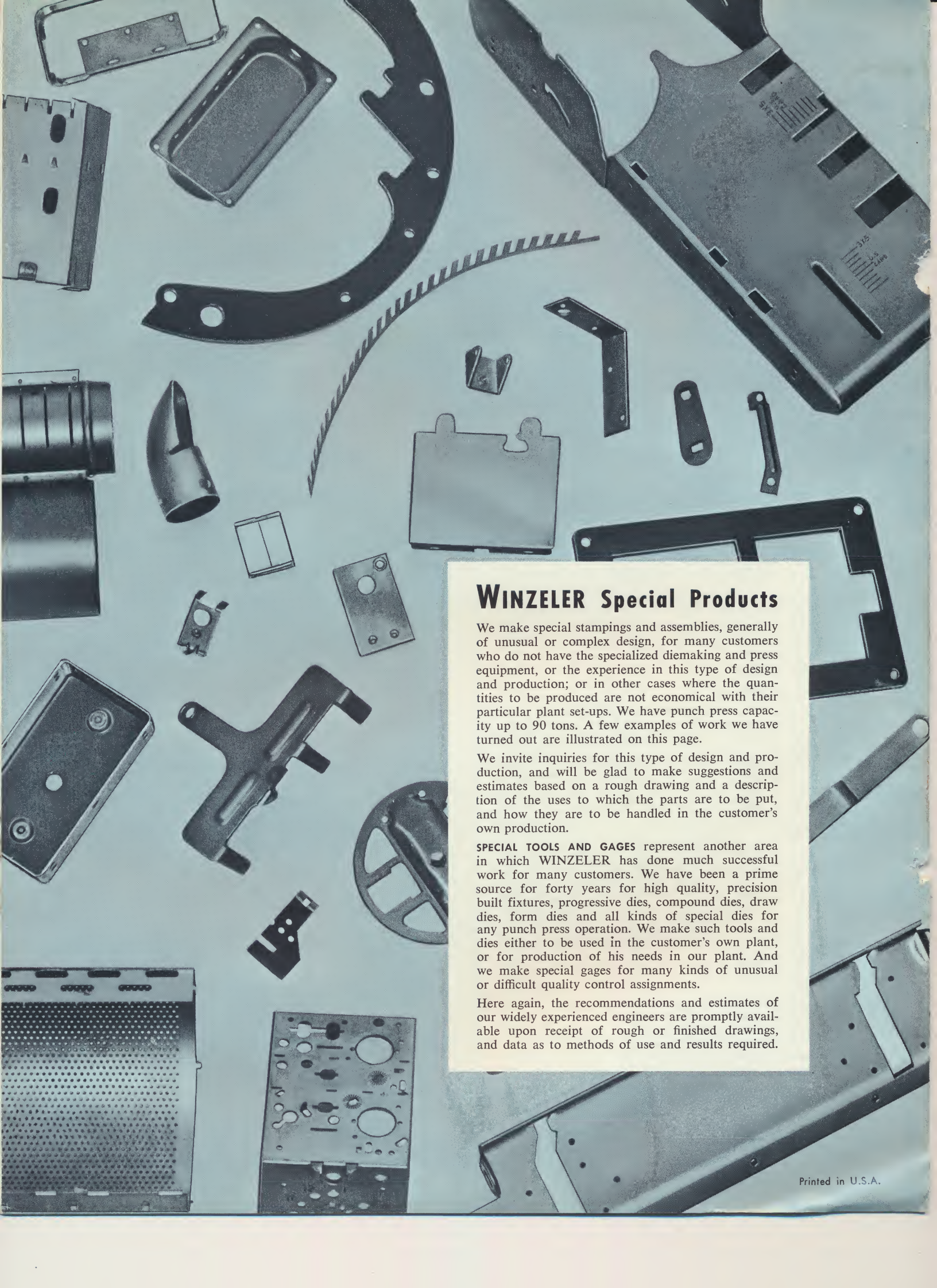


TYPE "X"  
EXTRUDED



TYPE "Z"  
SERRATED





## WINZELER Special Products

We make special stampings and assemblies, generally of unusual or complex design, for many customers who do not have the specialized diemaking and press equipment, or the experience in this type of design and production; or in other cases where the quantities to be produced are not economical with their particular plant set-ups. We have punch press capacity up to 90 tons. A few examples of work we have turned out are illustrated on this page.

We invite inquiries for this type of design and production, and will be glad to make suggestions and estimates based on a rough drawing and a description of the uses to which the parts are to be put, and how they are to be handled in the customer's own production.

**SPECIAL TOOLS AND GAGES** represent another area in which WINZELER has done much successful work for many customers. We have been a prime source for forty years for high quality, precision built fixtures, progressive dies, compound dies, draw dies, form dies and all kinds of special dies for any punch press operation. We make such tools and dies either to be used in the customer's own plant, or for production of his needs in our plant. And we make special gages for many kinds of unusual or difficult quality control assignments.

Here again, the recommendations and estimates of our widely experienced engineers are promptly available upon receipt of rough or finished drawings, and data as to methods of use and results required.